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ABSTRACT

The levels of performance on tests of black versus white students in 15 North Carolina public universities were examined; the validities of test scores and high school grades for predicting performance in college were also studied. Experimental variables obtained for each student included, as predictors, the SAT-V and SAT-M scores, and the standing of the student in his high school class of graduation. Criterion consisted of the student's first term grade average in college. For each of the four institutional sub-groups separately at each of the 15 institutions and then at each institution for all-black vs. all-white, all male vs. all female, and for all students combined, the zero-order correlations among the predictor and criterion variables were computed. Findings include: (1) Black students attending traditionally black universities have lower test scores than do black students attending traditionally white universities; (2) Black students at white institutions have lower scores than their white counterparts at that institution, but, in some instances, higher scores than white students at some other white institutions in North Carolina; (3) Black students at traditionally white institutions in North Carolina have higher standings in their high school class of graduation than do their white counterparts at that institution; and (4) the small number of black students found in traditionally white institutions in North Carolina prevent any conclusive interpretation of the data. (Author/CK)

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PR-71-3

THE VALIDITY OF TESTS AND ACHIEVEMENT IN HIGH SCHOOL FOR PREDICTING INITIAL PERFORMANCE IN THE PUBLIC UNIVERSITIES OF NORTH CAROLINA WITH SPECIAL ATTENTION TO BLACK STUDENTS

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March 1971

EDUCATIONAL TESTING SERVICE
PRINCETON, NEW JERSEY

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The Validity of Tests and Achievement in High School for Predicting Initial Performance in the Public Universities of North Carolina With Special Attention to Black Students

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A report prepared, within a contracted study, for the North Carolina Board of Higher Education

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Southeastern Office
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Durham, N. C.
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A number of other individuals gave particular time and critical attention to early drafts of this report. They include Dr. Robert Stoltz, Director of the Southern Regional Office of the College Entrance Examination Board; Dr. Julian Stanley, Johns Hopkins University; Dr. Robert Linn and Dr. Ronald Flaugher, Educational Testing Service; and Dr. John Davis, Associate Director of the Board of Higher Education. The authors retain responsibility, of course, for the conclusions and interpretations. However, of those that hold water, the critical solder provided by these individuals is frequently responsible.

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The Validity of Tests and Achievement in High School for Predicting Initial Performance in the Public Universities of North Carolina With Special Attention to Black Students

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Background and Purposes of the Study

Beginning in 1959, all public senior institutions in North Carolina have required that applicants for admission to the freshman classes submit scores on the Scholastic Aptitude Tests ("SAT") of the College Entrance Examination Board. There has been considerable institutional autonomy in deciding what use, if any, should be made of the resulting data, but some guidelines as to minimum scores have been recommended by the Board of Higher Education. More importantly, the availability of these data to those university staff who represent their institutions to prospective applicants, and who recruit and perhaps attract and select, overtly or subtly, entering classes, imposes on the institutions and the Board of Higher Education the responsibility of determining their validity and limitations as an estimate of individual academic promise, if promise is considered relevant to the question of who shall be afforded the opportunity for higher education in the public institutions of North Carolina, and if there are more applicants than available spaces in some institutions.

The academic year 1968-69 saw increasing evidence of concern by black applicants and students, as well as by some higher education officials, that tests may not reflect adequately the potential of black students and that their use - indeed, the simple fact of their availability to admissions officials -

may be prejudicial to the interests of black students and to those concerned with improving the opportunity for Blacks or other cultural minorities to attain access to higher education. On a number of campuses, some traditionally black and some traditionally white, this emerged as a demand for the removal of the test requirement. For example, on February 5, 1969, the Afro-American Society at Duke University published ten demands in the student newspaper, one of which read, en toto:

> We want academic achievement in high school to be the only criterion for black students' admission to this university. We believe that criteria for entering black students are oriented toward white middle class students, and therefore are inadequate for determining academic potential. Such criteria include the SAT, ACT, and the GRE.

At the same time, it was becoming increasingly apparent that the removal of any procedural barriers for the admission of black students to traditionally white institutions (or, of white students to traditionally black institutions), and in fact, aggressive recruiting of minority students by some institutions, were not being appreciably successful. In the fall of 1969, less than three percent of the entering students in the white public senior institutions were black; regular full-time white freshmen in black colleges were virtually non-existant. Thus, another pervasive concern behind the current study - and others in process - have to do with removing the real or subtle barriers to access to higher education that obviously exist.

Reflecting these concerns, the Board of Higher Education in North Carolina commissioned a formal study of the validity of test scores and other standard preadmissions data for the black students in both traditionally white and black public senior institutions. This report is directed, then, to this basic question within each of the fifteen public senior institutions: what is the meaning of test scores, with Blacks and Whites considered separately, as interpreted in initial performance in college?

It should be noted at the outset of this report that there are many other important questions to ask. For example: given the possibility of cultural difference that affects both test performance and academic performance, and the possibility that experience in college over time may serve to reduce any disadvantage - do tests and initial level of performance in college accurately reflect potential as measured by grades as a college junior or senior (than as a first term freshman)? Or, regardless of the relevancy of tests to preformance, what can be done to improve access of Blacks, or other minorities, to colleges and universities; and, once they are there, what can be done through educational treatment to bring them up to self-sustaining, satisfactory levels of academic performance? Some questions of this sort are being considered in other studies or activities of the Board of Higher Education, or of the individual institutions. The current study should be recognized as limited to these more specific questions: How valid are the tests now required (e.g., the two SAT scores), and measures of performance in high school for indicating, for Blacks and for Whites, the later initial level of performance in the fifteen public senior institutions in North Carolina? More specifically, are the tests indeed irrelevant for black students, if not for Whites (the common assumption in the typical black student demand)? And finally, if the black minority student is selected on the white majority standard (that is, if cutting scores developed on experience with Whites are applied to Blacks), will Blacks be excluded who have equal or better academic promise than accepted Whites?

Procedure

Institutions:

The institutions participating in this study were fifteen of the sixteen public senior institutions in North Carolina (North Carolina School of the Arts was excluded because of small size of entering class). Five of these institutions (coded A, B, C, D, and E in this report) are traditionally Negro institutions. In six of the other ten traditionally white institutions, at least thirty black entering freshmen who completed the first academic term could be identified in recent entering classes, while in the other four, no substantial number of black freshmen could be found.

Samples of Students:

The sample frame consisted of all full-time students entering in the fall of 1968 or the fall of 1969, with several exceptions noted on Table 4, page 19 of this report.

For students considered separately by sex and race on each campus, random samples of 100 students in each of the four sub-groups (by sex and race) were drawn, if there were more than 100 students in the sub-group (at two institutions where the total number of students was near this maximum, (institutions E and O) or where there were problems of missing data (institution D), all full-time entering freshmen were used). Where there were fewer than 100 students in one of the four sub-groups, all freshmen in that sub-group category were used. The choice between the 1968 or the 1969 entering freshmen was made generally on the basis of ready availability of the necessary data in the institutional files. In four cases, while the samples of white students came from one class, black students were drawn from that class and one or more prior year classes, in an attempt to obtain enough cases for statistical analysis. Classes involved in the final selection of samples can be found in Table 4.

One further restriction was imposed on the students at institution F, where approximately two-thirds take a regular English course that the other one-third exempt for advanced placement. In that case, the random samples were drawn from those in the regular English sequence.

The Experimental Variables:

The experimental variables obtained for each student included, as predictors, the SAT-V and SAT-M scores, and the standing of the student in his high school class of graduation (this latter index was transmuted to a standard score system with the median rank in high school equal to 50, and with a standard deviation of 10). The criterion reported in this study consisted of the student's first term grade average in college. This criterion is not as reliable as a freshman average or two year average, of course; it was chosen, however, to avoid unusual restriction of numbers, particularly among the black student groups, from early attrition from college. Another limitation is that in some institutional groups some students took some remedial or non-regular courses. Students enrolled for less than twelve credit hours were excluded.

The Provision of Data:

Each institutional president was asked by the Director of the Board of Higher Education for permission to include the institution in the study, and for the nomination of an institutional representative who would provide the research group with the necessary data. All presidents agreed to the study, and did name institutional representatives, who were directors of admission in some instances and of institutional research in others.

The institutional representatives were asked to provide rosters of full-time entering freshmen in 1968 or in 1969, with race of student identified, for the random selection of the sub-groups. For the samples, the following data were requested: SAT-V and SAT-M scores, the high school rank in class (or transcripts in two instances where large numbers of students came from high schools not reporting rank-in-class), and the first term grade average (or data such as copy

of college transcript from which this average could be completed). (A number of institutions were interested in other sub-groups of students, such as those in a high-risk program, or in other variables such as placement test scores. The additional analyses which these separate or non-uniform studies permitted will be reported in a separate paper.)

The Identification of Race of Student:

The greatest problem encountered in the assembly of the data was the identification of the black student on the traditionally white campus (There were in no instances on the black campuses more than two or three full-time entering white freshmen). This identification, difficult because of its necessary exclusion in regular university records, was accomplished in various ways, and probably with various degrees of success. On the smaller campuses, institutional representatives tended to feel that their knowledge, coupled with consultation with students and staff, was fairly accurate in this regard. On the larger campuses, identification was accomplished by inspection of pictures in class records, recourse to formal black student groups, knowledge of particular secondary schools as all-black, etc. It is suspected that in all but one case (Institution J) at least 90% of the black students in the classes in question were identified as black; this estimate is derived from comparing numbers found with those reported from (unidentified by name) registration reports to the Office of Civil Rights, U. S. O. E. At Institution J, probably no more than 50% of the black freshmen were identified, and two or three students in the white random samples for that campus may indeed have been Black, as could have been the case in the other institutional samples.

Treatment of Data:

For each of the four institutional sub-groups separately at each of the fifteen institutions, and then at each institution for all-black vs. all-white, all male vs. all female, and for all students combined, the zero-order correlations among

the predictor and criterion variables were computed. Also, the multiple correlations and regression equations were determined in each instance for the various predictors separately or combined.[1]

Inspection of the data (and, the basic purposes of the study) indicate the most interesting of the analyses to be those for the sex-by-race sub-groups. Data are reported in this paper for those instances where the number of students in those sub-groups equaled or exceeded thirty cases.

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[1] For those institutions with both black and white students, analyses of covariance were also conducted. The findings are reported in a separate technical paper by the authors.

Results and Discussion

The Range of Performance on the Indices Studied:

The data produced by the statistical treatment are most complex. To arrive at straightforward answers to the basic question of validity of tests for Blacks versus Whites, it is necessary to examine in orderly fashion a hierarchy of information.

Table 1 shows, for Blacks and for Whites at each institution where at least thirty Blacks or Whites could be identified, the numbers of students by racial group, and their means and standard deviations (a standard statistical measure of the spread, or dispersion of those scores on either side of the mean)[2] on the various measures used in this study.

Institutions A through E are the five traditionally Negro institutions in North Carolina; institutions F through K are six of the traditionally white institutions where as many as thirty black students could be identified; and institutions L through O are four traditionally white institutions where the number of Blacks that could be identified was too small for statistical treatment.

The data in Table 1 may be more intelligible if presented graphically. Figure 1 presents the Table 1 data for SAT-V; Figure 2 for SAT-M, Figure 3 for High School Rank, and Figure 4 for First Term Average.

The test data may be summarized as follows: In general, the white student groups have higher average test scores, whether SAT-V or SAT-M, than do the black student groups; black students in white institutions have higher scores than black students in black institutions; and, within each institution with both white and black student groups, the white student groups have higher first

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[2] If the scores were normally distributed, one standard deviation on either side of the mean would describe the range within which approximately 68% of the scores fall. For example, given a mean of 500 and S. D. of 75 for a particular group, where scores are distributed normally, the middle 68% of that group would have scores ranging from 425 to 575.

TABLE 1

Means and Standard Deviations, Preadmissions Indices
for North Carolina Public Senior Institutions

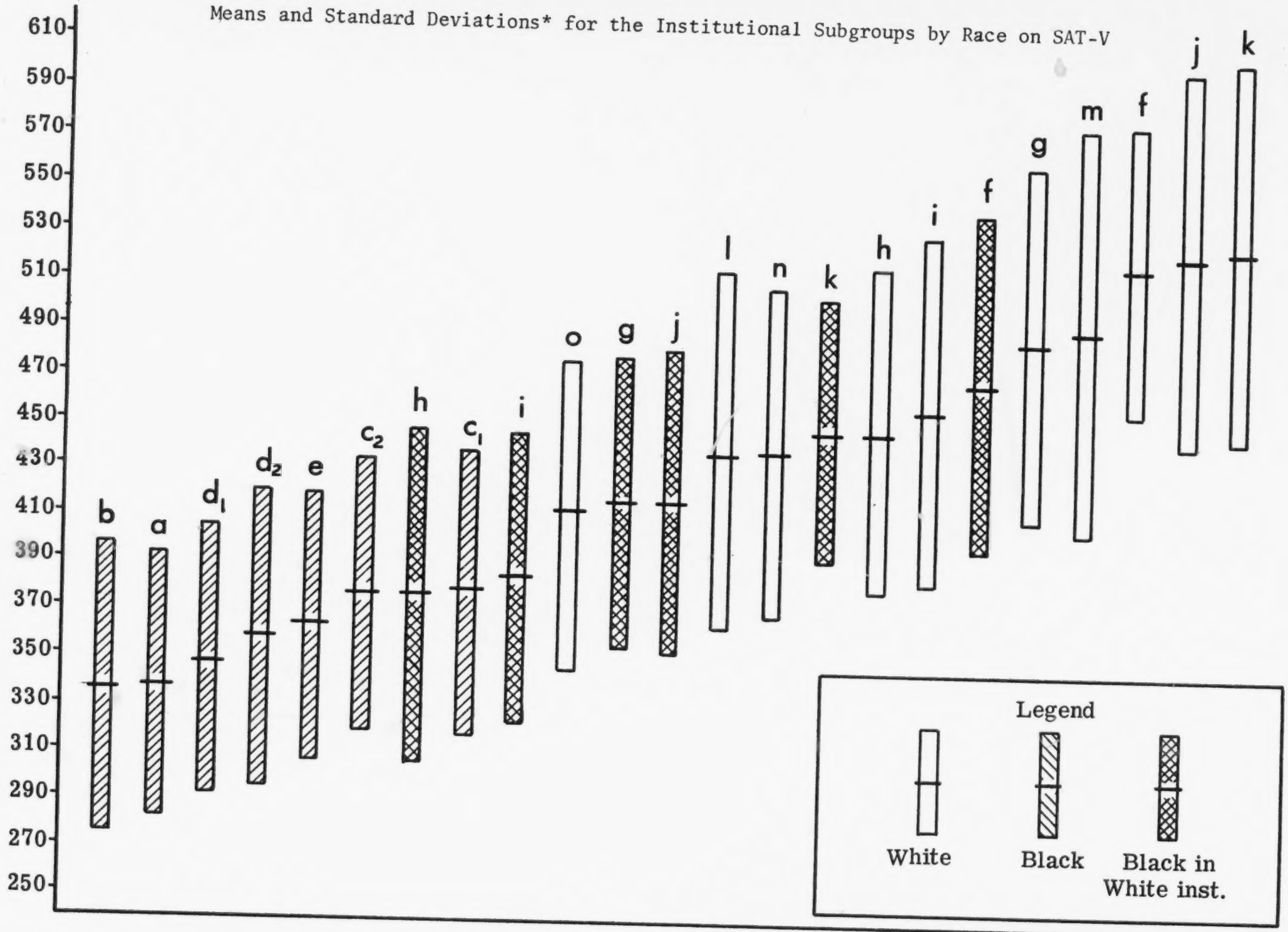
INSTITUTION	SAT-V White			SAT-V Black			SAT-M White		SAT-M Black		High School Rank White		High School Rank Black		First Term Average* White		First Term Average* Black	
	N	$\bar{X}$	S.D.	N	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.
A		X		193	337	55	X		360	54	X		57	7.6	X		2.0	.6
B		X		200	336	60	X		377	60	X		58	8.0	X		2.2	.6
C1		X		80	378	60	X		399	53	X		9.7**	2.07	X		2.1	.7
C2		X		118	376	57	X		401	59	X		58	7.9	X		2.1	.7
D1		X		552	348	56	X		374	60	X		56	8.6	X		2.1	.8
D2		X		187	358	61	X		387	68	X		56	5.9	X		2.1	.7
E		X		301	363	55	X		381	53	X		56	8.4	X		2.1	.7
F	201	516	61	97	468	71	570	66	506	69	63	6.9	65	7.2	2.4	.6	1.8	.8
G	200	484	74	67	416	62	512	71	461	61	58	5.8	60	8.6	2.3	.7	1.9	.7
H	175	447	68	32	376	70	479	73	395	74	57	7.1	56	7.1	2.2	.8	1.5	.8
I	193	455	74	41	383	61	506	82	414	72	58	6.3	61	5.8	2.0	.7	1.9	.7
J	200	521	79	43	416	64	562	78	469	88	62	6.6	64	6.0	2.3	.7	1.8	.7
K	187	524	80	38	446	55	543	72	462	51	60	9.6	65	5.0	2.1	.7	1.7	.7
L	200	437	75		X		453	69	X		55	7.2	X		1.9	.9	X	
M	152	490	85		X		513	79	X		58	7.2	X		1.3*	.6	X	
N	195	438	69		X		463	78	X		56	7.4	X		1.9	.8	X	
O	292	411	65		X		445	64	X		51	10.5	X		1.8	.7	X	
Range of Means	411 -524			336-468			445 -570		360-506		51 -63		56-65					

* All institutions use a 4-point grading system (e.g., A=4, B=3, etc.) with the exception of Institution M where a 3-point system is used.

** Grades expressed in a system where A+= 15 and F- = 1.

FIGURE 1

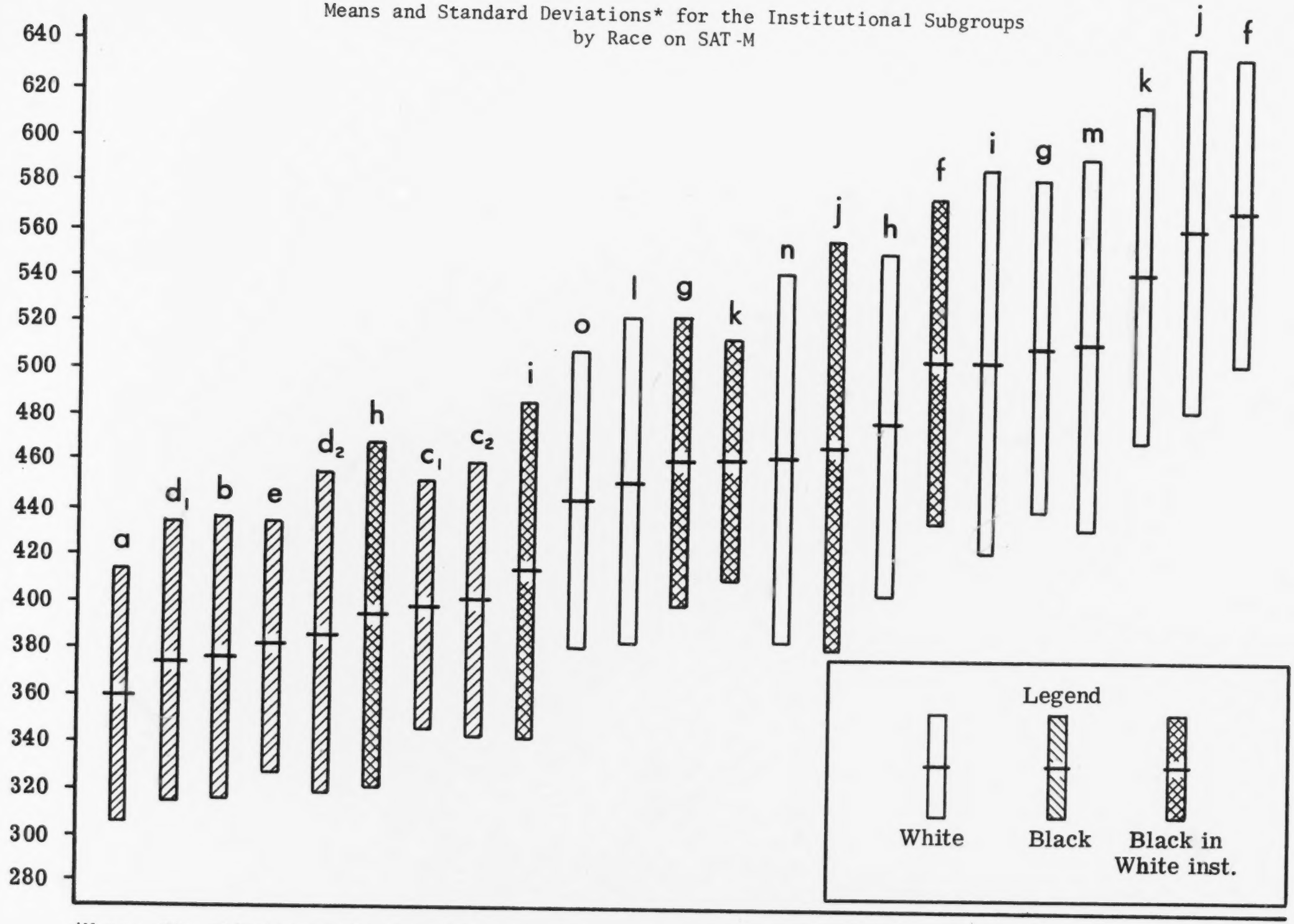
Means and Standard Deviations* for the Institutional Subgroups by Race on SAT-V



*Note: The midpoint of the bar indicates the mean; the length of the bar describes ± 1 standard deviation from the mean.

FIGURE 2

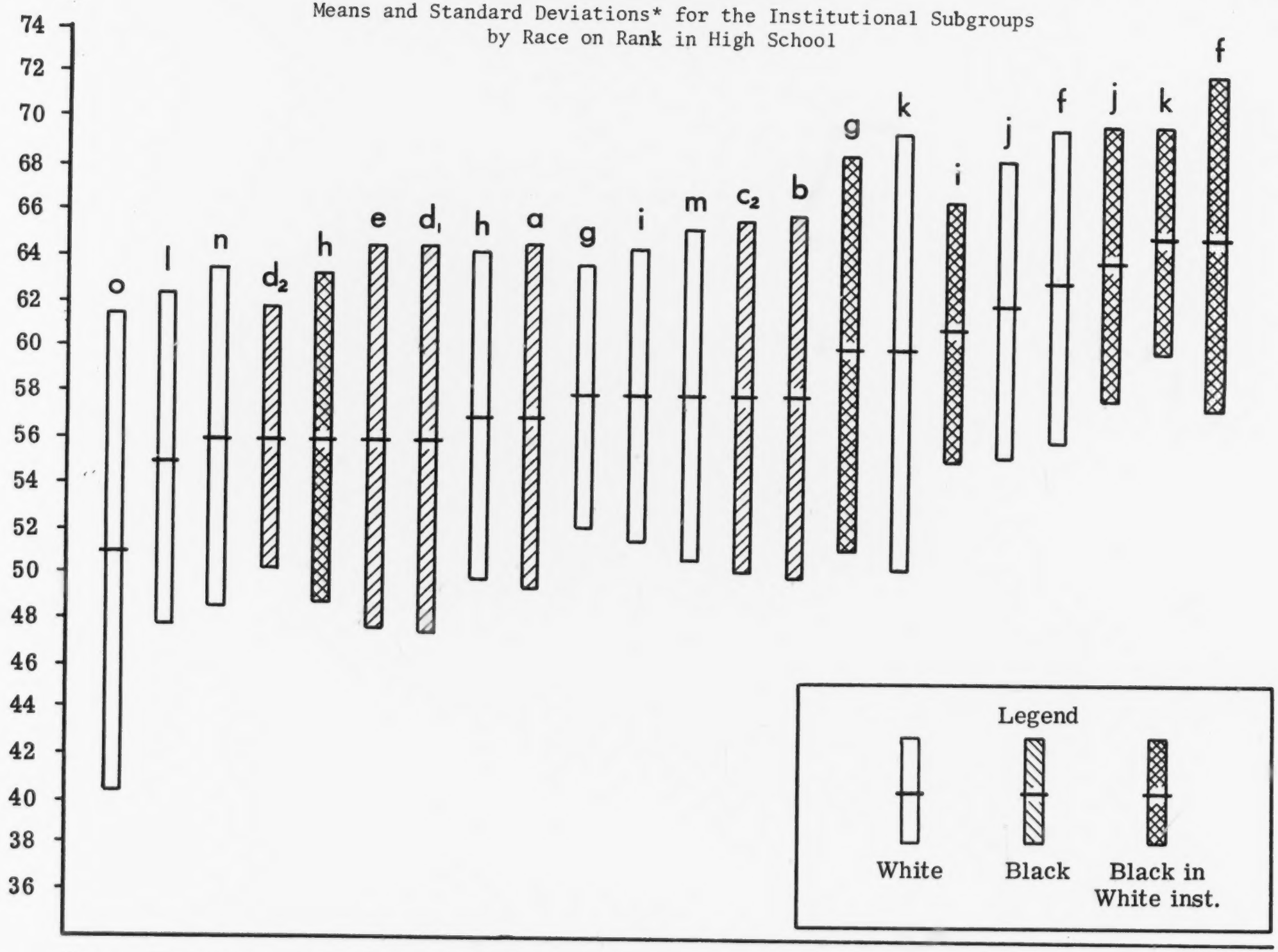
Means and Standard Deviations* for the Institutional Subgroups by Race on SAT-M



*Note: The midpoint of the bar indicates the mean; the length of the bar describes ± 1 standard deviation from the mean.

FIGURE 3

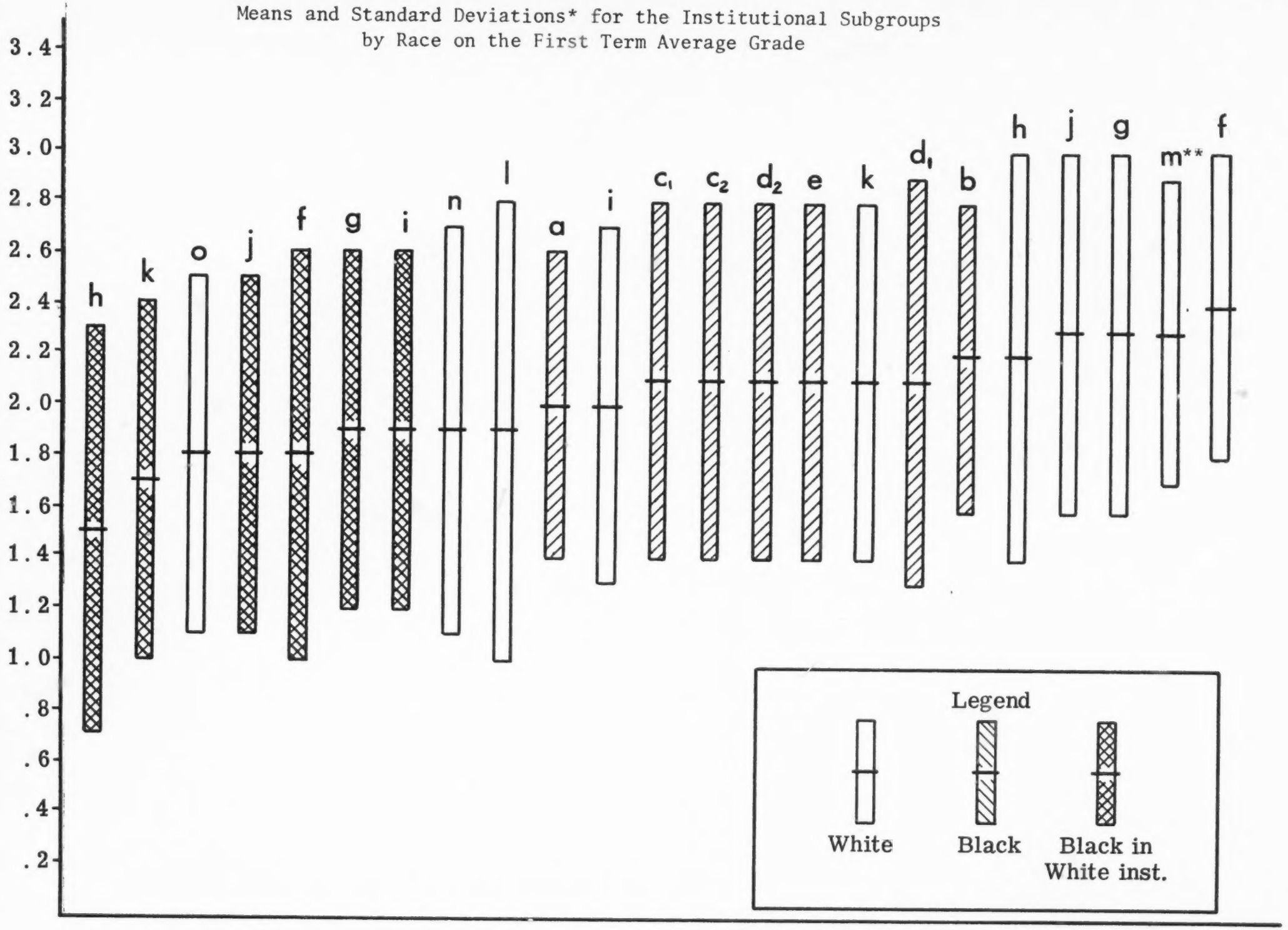
Means and Standard Deviations* for the Institutional Subgroups
by Race on Rank in High School



*Note: The midpoint of the bar indicates the mean; the length of the bar describes ± 1 standard deviation from the mean.

FIGURE 4

Means and Standard Deviations* for the Institutional Subgroups
by Race on the First Term Average Grade



*Note: The midpoint of the bar indicates the mean; the length of the bar describes $\pm$ 1 standard deviation from the mean.

**A value of 1.0 has been added to the mean shown in Table I, to compensate for the three point (rather than four point) grading system at Institution M.

term grade averages than the corresponding black student groups. Yet, as has been found in many other studies over public school or higher education systems, there are some black student groups whose mean test scores are higher than some white student groups.

It must be immediately noted and strongly emphasized that these data do not bear directly on the basic questions this study attempts to answer. However, the data do yield the following speculations that bear on some aspects of the broader problem:

1. Within the public university system of North Carolina, and its hierarchy of programs and target populations, some institutions appear to be accommodating white students who are equal to or below the test score level of black students being accomodated at another institution.

2. White institutions appear not to be demanding the same levels of performance on tests for admission of black students as they may demand for white students, although they may demand equal or higher levels of performance in high school for Blacks than for Whites. (At this point in time, it may be assumed that Blacks and Whites tend to come from different groups of high schools, and that high school grades may have different meaning.)

3. The first term averages of black students at white institutions tend to be lower than the first term averages of their white counterparts. (With the exception of institution I, the means for Blacks differ by more than one-half of a standard deviation from those for Whites.)

4. The traditionally black institutions are, at this point in time, accommodating students of lower levels of performance on tests than are the traditionally white institutions, although the range of level of performance in high school of black students at black institutions does not differ markedly from that of white students at white institutions.

Thus, the frequently heard concern among officials at black institutions that the white institutions are depriving them of the best prospective black students does seem justified by the data presented thus far if "best" is interpreted principally in terms of ability to perform well on scholastic aptitude tests. In addition, at least three white institutions - institutions F, J, and K - have black students whose average high school rank would fall in the top 16% of the range of high school performance by black students in black institutions. Thus, the movement of black students into traditionally white institutions, as it occurs under whatever social forces or selective practices affect this movement, does appear to leave lower levels of students for the traditionally black institutions.

These data also suggest that black institutions show lower levels of performance by students on tests administered prior to college than do white institutions, and that black students in white colleges score lower than do their white counterparts. Scholastic Aptitude Test scores have become equated in some quarters with "goodness" or"quality" and the lower positions on the hierarchy appear threatening to individuals or institutions so described. While this makes vigorous examination of the basic question - what is the meaning of test scores for Blacks - more crucial, it may also help to explain the black concerns about tests like SAT. There are components of personal and institutional threat in being described as "low" or "poor" on any index that has some popular currency. Also, dissemination of such an image can only be seen as damaging to the reasonable interests of the institution in attracting "good" students, or the resources needed to provide a high-quality educational experience.

The Relationships Between the Predictive Indices and First Term Performance:

Such issues make the examination of the meaning of the preadmissions indices more urgent. Let us now turn to the relationships found between the three common preadmissions indices studied (SAT-V, SAT-M, HSR) and the later first term performance.

Before this, however, a note of caution and a note of interpretation. The caution involves the frequent small numbers (Table 4) of Blacks found at the white institutions. The correlation coefficient, a standard measure of relationship, is an estimate of the degree of relationship between two measures - in this case, between a predictor such as SAT-V and a performance criterion such as the first term average grade. It is an estimate, and, although the range of error in the estimate can be determined, the extent of error possible grows as the size of the group diminishes. For example, the smallest subgroup of black students contains 34 individuals (institution H): given a correlation of .50 as that which really exists in a large but similar group, any sample of 34 students could produce a correlation coefficient less than .20 or greater than .72 about one time out of three.[3] For a similar group of 100 where the relationship is again .50, the corresponding range would be between .34 and .63. Thus, the relationships found in the smaller groups must be viewed with caution.

The note of interpretation has to do with the meaning of the correlation coefficient. This statistic can range from -1.00 to +1.00, with -1.00 showing perfect negative relationship, .00 showing no relationship, and +1.00 showing perfect positive relationship. Now: assume a group with an average first term performance of C (or 2.0 on the scale used herein, where A = 4.0, B = 3.0, etc.)

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[3] This statement is based on the assumption that the two variables being correlated have a bivariate normal distribution.

and with a standard deviation of one grade point or 1.0; and, assume a predictor with no relationship to the criterion of performance. With only this information, the best prediction procedure, on the average and over a large number of individuals, is to predict an average of 2.0 for all students admitted in a subsequent year. This obviously will not aid differential decisions that may be required but it will make smaller errors on the average than any other procedure. Given, however, a predictor (say, the SAT-V score) with a correlation of .50 with the performance criterion in a previous year, one may now employ that finding (1) to produce for new applicants, through appropriate statistical procedures, an estimate of performance that may fall at, above, or below the group average of 2.0; and (2) to sustain a smaller range of error - (i.e., the differences between predicted and actual grade point averages will tend to be smaller than would be the case without knowledge and use of the relationship.

As a further guide to the statistical layman, Tables 2 and 3 provide what might be considered typical patterns of relationship between the key variables used in this study for (in Table 2) a typical high school senior class, and for (in Table 3) a typical college freshman class. These tables are provided because, first, in common practice, a "high" relationship is not, say, .80, but rather a figure something better than that typically found. Second, it should be noted that as the range (or S.D.) becomes restricted, the relationship between the variables tends to become smaller (given the extreme case of no range on one variable - or, where everyone has the same SAT-V scores - there must be .00 relationship between that variable and any other associated variable).

The numbers of students with data on at least one of the predictors and the criterion, and contained in each institutional subgroup, are given in Table 4.

The relationship between SAT-V and the first term average grade are given in Table 5, for those institutional subgroups where the number of students is

TABLE 2

Typical Standard Deviations and Intercorrelations

for an Unselected Sample of

High School Seniors

Variable	Intercorrelations 1	2	3	Mean	SD
1. SAT-V	1.00	.60	.45	375	100
2. SAT-M		1.00	.40	375	100
3. HSR			1.00	50	10

TABLE 3

Typical Standard Deviations and Intercorrelation

for a Sample of College Freshmen in

a Typical Four Year Public College

Variable	Intercorrelations 1	2	3	4	Mean	SD
1. SAT-V	1.00	.45	.40	.32	480	82
2. SAT-M		1.00	.30	.28	490	75
3. HSR			1.00	.45	56	8
4. FTGA				1.00	2.0	.7

TABLE 4

Numbers of Students by Institution, Sex, and Race, Involved in the North Carolina Study of Pre-admissions Indices

Institution	White				Black			
	Male	Female	Total	Class Entering	Male	Female	Total	Class Entering
A	0	0	0		100	100	200	'68
B	0	0	0		100	100	200	'69
C1	0	0	0		45	35	80	HSA '68
C2	0	0	0		53	65	118	HSR '68
D1	0	0	0		210	342	552	'69
D2	0	0	0		70	117	187	'69
E	0	0	0		118	183	301	'69
F	100	102	202	'68	74	24	98	'68 '69
G	100	100	200	'68	36	31	67	'67 and following
H	92	83	175	'69	23	11	34	'68 '69
I	100	100	200	'68	23	18	41	'66 and following
J	100	100	200	'69	29	14	43	'69
K	87	102	189	'68	5	33	38	'68
L	100	100	200	'68	0	0	0	
M	86	66	152	'68	0	0	0	
N	96	99	195	'68	0	0	0	
O	222	70	292	'67	0	0		

TABLE 5

Relationships between SAT-V and the First Term Average Grade

Institution	White			Black		
	Male	Female	Total	Male	Female	Total
A	X	X	X	14	32	22
B	X	X	X	14	24	18
C1	X	X	X	48	34	40
C2	X	X	X	01	14	07
D1	X	X	X	15	35	28
D2	X	X	X	25	34	29
E	X	X	X	15	20	17
F	20	15	19	-05	X	13
G	26	36	35	-06	02	06
H	17	24	24	X	X	26
I	29	33	31	X	X	19
J	43	32	38	X	X	43
K	17	38	29	X	59	59
L	31	38	36	X	X	X
M	40	33	37	X	X	X
N	26	41	37	X	X	X
O	27	51	38	X	X	X

Note: Decimal points omitted

equal to or greater than 30. It should also be noted that because there are frequently sex differences in such data, Table 5 shows the correlation coefficients for black vs. white subgroups further divided by sex.[4]

For white males, the correlations between SAT-V and college grades range from .17 to .43; for white females, from .15 to .51. For black males, the range is from -.06 to .48; for black females from .02 to .59. There appears, first, to be striking differences among institutions. But, beyond this, five of the nine black female groups show correlation coefficients at or above the level of r = .32 (the "typical" value given in Table 3) while only one of the nine black male groups exceed a value of r = .32; eight of ten white female groups equal or exceed a value of r = .32, while only two of ten white male groups exceed a value of r = .32.

The results would seem to indicate tentatively that in the years and institutions studied, SAT-V is a better predictor for females than for males, and that this difference overshadows any difference between Black vs. White.[5] Beyond that, however, and as noted earlier, there seem to be institutional patterns. For these samples of students, black females at institution K form the most predictable group from SAT-V (this is not discrepant from a study /Harris and Rietzel, 1967/ conducted several years ago by that institution). For black males - perhaps particularly those at white institutions, but also for those at black institutions (with the exception of the one subgroup at institution C) - SAT-V seems a poor predictor of later college performance.

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[4] The heterogeneity of students on predictor and criterion variables affects the size of the correlation coefficients, of course. Complete data are given in the Appendix.

[5] Some statisticians will be concerned about the failure to apply the concepts of statistical significance of differences. Data are provided that would permit the exercise of these tests. The intent of the present examination is to search for general trends in the data, recognizing that all samples are small and hence somewhat unreliable for any single comparison of two groups.

Table 6 shows the relationships found between SAT-M and the first term average grade. Similar patterns as those noted for SAT-V prevail, although relationships in general tend to be somewhat lower. Taking the r = .28 shown in Table 3 as an estimate of the usual value, eight of the nine coefficients for black females fall above this value, and seven of ten coefficients for white females fall above this value. For the male groups, none of the nine black and only four of the 10 white groups reach this figure. Again, females tend to be more predictable from SAT-M scores than are males.

In studies over the country comparing the predictive power of scholastic aptitude or achievement tests against measures of performance in high school, the past performance variable has generally been the better predictor. Table 7 shows the relationships found in this study between the high school rank and the first term average grade.

Again, taking the value shown in Table 3 as an approximation of the usual value of the relationship between HSR and FTAG (r = .45), the separate sex/race subgroups exceed this value in four of nine instances for black females, six of ten instances for white females, three of ten instances for white males, and in none of the nine instances for black males.

Taking the data shown in Tables 5, 6, and 7, one may conclude that as in other studies, the HSR, or previous performance in high school, seems to be generally the best single predictor of performance in college, and that the SAT scores work somewhat less well; that the validities seem to vary from institution to institution, and for males vs. females. If there are differences in validity by race, the data suggest that females (either black or white) tend to be the most predictable, then white males, then black males. It must be finally noted, with regard to the relationships, that there are a number of instances where, for a particular subgroup in a particular institution, the relationships are so small as to be inconsequential.

TABLE 6

Relationships between SAT-M and the First Term Average Grade

Institution	White			Black		
	Male	Female	Total	Male	Female	Total
A	X	X	X	12	44	26
B	X	X	X	15	29	18
C1	X	X	X	04	06	06
C2	X	X	X	04	33	06
D1	X	X	X	15	33	24
D2	X	X	X	24	36	25
E	X	X	X	07	29	19
F	24	19	21	23	X	26
G	15	35	23	27	37	30
H	20	18	15	X	X	14
I	29	36	28	X	X	09
J	52	29	37	X	X	39
K	09	42	20	X	37	40
L	28	46	32	X	X	X
M	15	26	13	X	X	X
N	27	40	28	X	X	X
O	28	34	22	X	X	X

Note: Decimal points omitted

TABLE 7

Relationships between the High School Rank

and the First Term Average Grade

Institution	White			Black		
	Male	Female	Total	Male	Female	Total
A	X	X	X	19	58	42
B	X	X	X	34	49	44
C1	X	X	X	36	53	46
C2	X	X	X	16	31	29
D1	X	X	X	35	42	42
D2	X	X	X	32	32	35
E	X	X	X	28	37	36
F	36	36	37	11	X	21
G	34	44	43	24	66	46
H	54	47	55	X	X	22
I	37	61	51	X	X	45
J	45	34	42	X	X	06
K	07	54	33	X	37	40
L	21	66	49	X	X	X
M	35	34	39	X	X	X
N	52	61	61	X	X	X
O	26	50	43	X	X	X

The Relationship of the Optimum Combination of the Predictors to the Criterion:

Studies over the country have shown that adding several predictive indices together may improve the predictive efficiency over that from a single predictor, and that adding scholastic test scores to high school performance generally serves in this fashion.

Table 8 shows the "multiple correlation coefficients," or a measure of relationship between what appropriate statistical procedures find to be the sum of the optimum weighting of SAT-V, SAT-M, and HSR on the one hand, and the freshman average grade on the other.

Considering only those multiple correlation coefficients for the sex groups (e.g., not for the combined groups), the median value is about r = .50. In the nine black female groups, six exceed this value, as do six of the ten white female groups, four of the ten white male groups, and one of the nine black male groups. Furthermore, taking an arbritrary value of the multiple correlation being equal to or less than r = .30 as an instance where this value is so low in relation to usual findings that the predictive efficiency is hardly worth the trouble, three of the black male groups, one of the white male groups, and none of the female groups fall below this value.

It should also be noted that in three instances (institutions H, I, and J) there were insufficient numbers of black students to warrant separate computations by sex, and that the values of R for all black students (male and female) are .36, .46, and .49. These tend to be somewhat low when compared with the R's for other total black groups; nevertheless, they seem too substantial to be ignored in estimating probable academic performance of black students at those institutions.

TABLE 8

Multiple Correlation Coefficients for Relationships between

Preadmission Indices (SAT-V, SAT-M, HSR) and the First Term Average Grade

Institution		White			Black		
		Male	Female	Total	Male	Female	Total
A	A	*	*	*	25	63	47
	B	*	*	*	35	52	46
	C1	*	*	*	53	63	56
	C2	*	*	*	16	42	29
	D1	*	*	*	38	53	49
	D2	*	*	*	44	49	47
	E	X	X	X	31	45	41
	F	41	40	41	28	X	31
	G	46	56	53	35	67	50
	H	54	48	55	X	X	36
	I	44	62	54	X	X	46
	J	65	47	56	X	X	49
	K	20	61	43	X	67	70
	L	38	71	56	*	*	*
	M	51	47	52	*	X	*
	N	58	57	66	X	X	*
	O	42	64	54	*	*	*

* Data not shown where N $\leq$ 30.
Note: Decimal points omitted.

The Best of the Three Predictors for Each Subgroup by Institution, Sex, and Race:

Tables 9A and 9B show another element worth considering, present to some extent in data previously presented but obscured by their complexity. That is, (1) within each institutional subgroup by race and sex, which predictor (of the three) has the highest relationship to the criterion; (2) what is this relationship; (3) how much is it improved by adding the second predictor which improves the first the most; and then (4) how much is that improved by adding the third predictor (thus yielding the R value shown in Table 8).

The data in Table 9 affirm one previous observation; that is, the measure of past performance in high school is most frequently the best single predictor. Yet, for the groups shown in 8 of 21 instances for black groups and in 6 of 20 instances for white groups, one or the other of the two test scores does a better job for the sample of students studied.

A second observation - not atypical for such data - is that in most instances the improvement in prediction that accrues from adding a second and third predictor is not substantial. This is an aspect of the phenomenon that the several predictors tend to have interrelationships among one another, in addition to their separate relationship to the criterion.

The Probable Impact of Using "White" Admissions Formulas on Black Applicants to White Institutions:

The studies conducted yield specific prediction formulas for optimally weighing the several preadmissions indices and converting the sum into a predicted grade. In the white institutions, it may be assumed that by 1969-70 few admissions officers and institutional researchers in the white institutions have had experience with, or sufficient numbers for specific study of, black students at that institution. In terms of the basic issue

TABLE 9A

Step-wise Correlation Coefficients for the Three Predictors, in Order of their Contribution: Black Students

Institution	Subgroup	Best Predictor	r	2nd Predictor	R	3rd Predictor	R
A	M*	HSR	19	SAT-V	23	SAT-M	25
	F	HSR	58	SAT-M	61	SAT-V	63
B	M	HSR	34	SAT-V	35	SAT-M	35
	F	HSR	49	SAT-M	51	SAT-V	52
C1	M	SAT-V	48	HSAV	53	SAT-M	53
	F	HSAV	53	SAT-V	63	SAT-M	63
C2	M	HSR	16	SAT-M	16	SAT-V	16
	F	SAT-M	33	HSR	40	SAT-V	42
D1	M	Actual Rank	35	SAT-V	37	SAT-M	38
	F	Actual Rank	42	SAT-V	49	SAT-M	53
D2	M	Estimated Rank	32	SAT-M	42	SAT-V	44
	F	SAT-M	36	Estimated Rank	44	SAT-V	49
E	M	HSR	28	SAT-V	31	SAT-M	31
	F	HSR	37	SAT-M	44	SAT-V	45
F	M	SAT-M	23	SAT-V	26	HSR	28
G	M	SAT-M	27	HSR	35	SAT-V	35
	F	HSR	66	SAT-V	67	SAT-M	67
H	All	SAT-V	26	HSR	34	SAT-M	36
I	All	HSR	45	SAT-V	45	SAT-M	46
J	All	SAT-V	43	SAT-M	48	HSR	49
K	F	SAT-V	59	HSR	65	SAT-M	67

Data not shown where N $<$ 30

Note: Decimal points omitted

* M = Male
F = Female

TABLE 9B

Step-wise Correlation Coefficients for the Three Predictors, in Order of their Contribution: White Students

Institution	Subgroup	Best Predictor r		2nd Predictor R		3rd Predictor R	
F	M*	HSR	36	SAT-M	40	SAT-V	41
	F	HSR	36	SAT-V	39	SAT-M	40
G	M	HSR	34	SAT-V	45	SAT-M	46
	F	HSR	45	SAT-M	54	SAT-V	56
H	M	HSR	54	SAT-V	54	SAT-M	54
	F	HSR	47	SAT-V	48	SAT-M	48
I	M	HSR	37	SAT-V	43	SAT-M	44
	F	HSR	61	SAT-V	62	SAT-M	62
J	M	SAT-M	52	HSR	62	SAT-V	65
	F	HSR	34	SAT-V	45	SAT-M	47
K	M	SAT-V	17	HSR	19	SAT-M	20
	F	HSR	54	SAT-M	60	SAT-V	61
L	M	SAT-V	31	SAT-M	36	HSR	38
	F	HSR	66	SAT-V	71	SAT-M	71
M	M	SAT-V	40	HSR	51	SAT-M	51
	F	HSR	34	SAT-V	47	SAT-M	47
N	M	HSR	52	SAT-V	58	SAT-M	58
	F	HSR	61	SAT-M	65	SAT-V	67
O	M	SAT-M	28	SAT-V	38	HSR	42
	F	SAT-V	51	HSR	64	SAT-M	64

Data not shown where $N \leq 30$

Note: Decimal points omitted

* M = Male
  F = Female

in the present inquiry - that is, the potentially prejudicial application of "white" standards to black applicants - it is germane to ask what the application of the white formulas to black students would yield, and how this compares with their actual performance. This is not a recommended procedure; but, with only "white" experience, it is conceivable that only white formulas could have been applied.

Accordingly, the prediction formulas for white subgroups at each of the six traditionally white institutions with thirty or more black students were derived and are reported in Table 10. Then, these formulas were applied to the average black student at that institution - on each of the three preadmission indices - to obtain a predicted grade. Such a predicted grade, is most precisely, the average grade that all white students with the same preadmission scores would be expected to achieve.

Table 11 shows the predicted grade for the mean (on each of the three predictors) black student from the white equation for that institution, as well as the actual grade made by the mean black student. It is important to note that in every instance using the test scores and HSR, and applying the white equation to the mean test scores and HSR's of black students, yields a prediction that is higher than the black students actually obtain - or that is higher than the prediction made if black equations were used.

This means that if admissions officers used the white equations for black as well as white students, and admitted a group of white students and a group of black students with HSR and SAT scores equal to the means for black students, the average freshman grade point average of the group of black students would be lower than the average grade point average for the group of white students. If such admissions procedures are biased, they seem biased in favor of, not against, the black applicant.

TABLE 10

Regression Equations Used in Computing Predicted Grades for Black Students in White Institutions

Institution	Subgroup	Equation
G	White Males	PG = .0030 V + .0010 M + .0522 HSR - 2.6923
	Black Males	PG = .0009 V + .0038 M + .0200 HSR - 1.5593
	White Females	PG = .0016 V + .0023 M + .0470 HSR - 2.4302
	Black Females	PG = .0009 V + .0004 M + .0475 HSR - 1.3747
	All White	PG = .0022 V + .0017 M + .0474 HSR - 2.424
	All Black	PG = .0009 V + .0022 M + .0348 HSR - 1.560
F	White Males	PG = .0008 V + .0014 M + .0299 HSR - .6626
	Black Males	PG = .0016 V + .0031 M + .0107 HSR + .2215
	All White	PG = .0009 V + .0012 M + .0298 HSR - .6286
	All Black	PG = .0000 V + .0026 M + .0187 HSR - .7861
H	All White	PG = .0001 V + .0001 M + .0570 HSR - 1.5028
	All Black	PG = .0027 V + .0011 M + .0289 HSR - 1.5610
I	All White	PG = .0014 V + .0007 M + .0489 HSR - 1.8830
	All Black	PG = .0009 V + .0003 M + .0509 HSR - 1.6992
K	Black Females	PG = .0062 V + .0022 M + .0328 HSR - 4.2618
	White Females	PG = .0013 V + .0016 M + .0436 HSR - 2.0747
	All Black	PG = .0063 V + .0026 M + .0367 HSR - 4.7481
	All White	PG = .0020 V + .0009 M + .0221 HSR - .7480
J	All Black	PG = .0032 V + .0020 M + .0078 HSR - .9921
	All White	PG = .0023 V + .0020 M + .0370 HSR - 2.3434

TABLE 11

Predicted Grades for Black Students at White Institutions,

Using Various Regression Equations Derived from the Study

titution	Subgroup	Mean Student			Predicted Grade, using Equation for:			
		V	M	HSR	All White	White, same sex	All Black*	Black*; same sex
G	M	401	462	59	X	2.05	X	1.72
	F	434	459	62	X	2.23	X	2.14
	Total	416	461	60	2.12	X	1.92	X
F	M	453	496	63	X	2.23	X	1.70
	Total	468	506	65	1.96	X	1.75	X
H	Total	376	395	56	1.69	X	1.51	X
I	Total	383	414	61	1.93	X	1.87	X
K	F	448	466	66	X	2.13	X	1.93
	Total	446	462	65	2.00	X	1.65	X
J	Total	416	469	64	1.93	X	1.78	X

* This "predicted grade" is, for the "mean" student, the actual grade point average made by all students in the particular subgroup.

This finding, also noted in other studies to be cited in a later section, is understandable if one considers the possibility that the cultural deficits that may cause Blacks to perform at lower levels on tests are not the only handicap they bring currently to white institutions. They are likely to have had a different kind of preparation, and may have experienced different grading practices and competition; they enter a new majority world as a minority where they may compete at previously unexperienced levels and in previously unpracticed ways, and where the more "traditional" preparation assumed by instructors and the curriculum is most strictly a white experience. If the preadmissions measures have intrinsic validity - or, more precisely, if they reflect the same cultural biases that the traditional college curriculum contains - the black student needs a greater ability and performance offset to survive than does the white student, given no special help, or only that which may presently be given.

However, the overprediction may result from subtleties in regression concepts. Linn and Werts (1970) have shown that predictor unreliability, as well as the effect of excluding a predictor from the regression equation on which there are pre-existing group differences, can produce an overprediction more apparent than real. The technical reader is referred to their paper.

Another limitation draws from the nature of the regression lines or surfaces. In non-technical language, this refers to the fact that with different validity coefficients for two groups being compared in the manner described in the preceding paragraphs, the predicted grade averages may rise more steeply for one group as one moves up a range of values on the predictors than for the other. Thus, black students somewhat above or below the black means may have actual grades that vary more or less (or,, conceivably,

vary in an opposite direction) from the predicted grade afforded by the white equation, than is the case for black students at the black student means on the three predictors (e.g., as presented in Table 11).

It is difficult to present efficiently the effects of this phenomenon for all the schools studied, but perhaps a sample treatment of one institution will suffice to illustrate this limitation of incongruent regression surfaces. This is done in Table 12, where black students one standard deviation above and below the black student means at institution G are treated, and their actual grades versus their grades as predicted by the formulas based on the white experience are shown.

In this case, as one moves down the range of values on SAT and HSR, the difference between actual grades and white formula-based predicted grades tends to grow smaller. In other cases, the obverse could obtain.

Any particular institution interested in estimating the probable implications of this phenomenon might use their regression equations to observe how a variety of values for SAT-V, SAT-M, and HSR could yield an "over-prediction" or "under-prediction" for Blacks with particular scores when these values are inserted into the white or all-college formulas used in admissions. This is an interesting and important exercise in determining if an institution, following rather rigidly a selection procedure based on all-white or essentially all-white experience, may have acted prejudicially in the past. The answer to that question may be better provided by other procedures (e.g., analysis of proportions of Black vs. White who graduate), and it would seem more important to invest time in accumulating and studying separately the black vs. white performance as a function of pre-admissions indices toward perfecting admissions procedures and philosophy.

TABLE 12

Predicted Grades for Black Students at Three Selected Levels at Institution G Using Equations Based on White vs. Black Student Performance

Example	Standing of Black Student on			Predicted Grade Based on	
	SAT-V	SAT-M	HSR	White Equation	Black Equation
1	478	522	68.6	2.77	2.41
2	416	461	60.0	2.12	1.92*
3	354	400	51.4	1.47	1.43

*This "predicted grade" is for the "mean" student, and corresponds to the actual grade point average made by all students in the particular subgroup.

The Interrelationships Among the Predictors:

The interrelationships among the predictors are shown in Tables 13, 14, and 15. Table 13 shows the correlation coefficients expressing the relationship in each of the subgroups for SAT-V vs. SAT-M.

The most surprising aspect of the data in Table 13 is the range of coefficients found -- from r = -.44 (black males, college G) to r = .55 (black females, college B). It is known that in unselected samples there is a moderate positive relationship between these two scores. There could be considerable instability in the data because of the small samples; or, there could be selection forces (e.g., direct action of admissions officers in selecting students, or beliefs among college aspirants that result in self-sorting) that tend to favor individuals with a high score on one of the tests and low scores on the other. For example, there may be a belief that for those students with high SAT-M scores and low SAT-V scores, the only reasonable option is an engineering program such as that offered by N. C. State University or A & T State University.

Inspection of the data against the particular institutions does not particularly support the second hypothesis. What does emerge, in that framework and from conversations with admissions officers at the institutions, is that the low or negative relationships between SAT-V and SAT-M found in this study may be a result of the practice in North Carolina among admissions officers (and high school counselors and students) of adding the two scores together, and taking action on the weight of the composite. For, it appears that where this relationship is lower than expected, or negative as for black males at institution G, the institutions are generally those where the applicant pool probably, and the admitted students certainly, have composite SAT scores very near the value of 750 or 800 that in practice the traditionally white universities treat as the desirable minimum for admission. If this is what is operating, it means first that the institutions are

TABLE 13

Relationships between SAT-V and SAT-M

Institution	White			Black		
	Male	Female	Total	Male	Female	Total
A	X	X	X	25	17	21
B	X	X	X	27	55	39
C1	X	X	X	17	22	19
C2	X	X	X	37	11	26
D1	X	X	X	29	32	30
D2	X	X	X	52	42	46
E	X	X	X	19	22	21
F	44	30	36	35	X	44
G	21	40	28	-44	25	-04
H	14	25	17	X	X	43
I	50	39	43	X	X	22
J	43	38	38	X	X	44
K	19	51	34	X	25	20
L	29	45	36	X	X	X
M	39	30	32	X	X	X
N	33	49	38	X	X	X
O	03	38	08	X	X	X

TABLE 14

Relationships Between SAT-V and the High School Rank

Institution	White			Black		
	Male	Female	Total	Male	Female	Total
A	X	X	X	03	24	13
B	X	X	X	18	20	17
C1	X	X	X	30	-02	18
C2	X	X	X	06	04	04
D1	X	X	X	06	20	16
D2	X	X	X	-03	06	01
E	X	X	X	01	18	09
F	18	02	17	-09	X	16
G	-11	29	20	00	-12	-01
H	18	33	30	X	X	-04
I	21	35	28	X	X	24
J	24	07	17	X	X	06
K	-07	27	10	X	16	11
L	27	22	27	X	X	X
M	10	01	07	X	X	X
N	04	33	26	X	X	X
O	12	24	21	X	X	X

TABLE 15

Relationships between SAT-M and the High School Rank

Institution				Black		
	Male	Female	Total	Male	Female	Total
A	X	X	X	-04	46	20
B	X	X	X	28	27	22
C1	X	X	X	02	02	04
C2	X	X	X	29	27	19
D1	X	X	X	16	21	15
D2	X	X	X	-08	22	01
E	X	X	X	06	15	07
F	18	19	16	01	X	17
G	-01	13	00	06	47	28
H	29	37	27	X	X	-21
I	25	50	28	X	X	08
J	23	20	19	X	X	-09
K	10	34	12	X	31	35
L	26	51	31	X	X	X
M	23	40	22	X	X	X
N	18	27	14	X	X	X
O	16	45	17	X	X	X

accepting (or receiving) students who achieve the composite minimum score in whatever way - high V and low M, or high M and low V or moderate V and M - regardless of any differential relationship of one or the other score to grades at that institution. A possible consequence is the introduction of factors that produce unusual, if not erratic, patterns of relationship between the separate scores and the criterion.

This pattern of unexpected low or zero relationship (or perhaps negative relationships, although the negative relationships are generally neither statistically or practically significant) is even more marked in the data for SAT-V vs. HSR (Table 14), and SAT-M vs. HSR (Table 15). This seems to be more marked for the black males, or for the black students in white institutions, although there are occasional exceptions. The most reasonable hypothesis is that a high test score is seen as an offsetting datum for a lower record of achievement in high school.

Thus, there emerges the possibility that the availability of, and focus upon, the two (HSR and SAT composite) or three (SAT-V, SAT-M, and HSR) quantitative pre-admissions indices, and the fact that some North Carolina institutions may use high scores in one instance to offset low scores in another, tends to affect the usual relationships of the predictors to the criterion as well as to one another.

There is another standard characteristic of such arrays of measures that may affect relationships. This is the already noted tendency of relationships to shrink when the range on one or both of the variables in question is restricted, or to expand when the range is more heterogeneous.

To make a point: At institution G, white and black females produced the intercorrelation matrices shown in Table 16. Inspection of the figures in the table suggests that the higher standard deviation in HSR for black females than was found for white females may help explain why in these two samples HSR is a better predictor for black females than for white females at this institution. To put the notion in more down-to-earth language: selecting (or attracting) only relatively high

TABLE 16

Correlations, Means, and Standard Deviations for

Black Females vs. White Females at Institution G

Blacks

	Variable	1	2	3	4	Mean	S. D.
1.	SAT-V	X	.25	-.12	.02	434	67
2.	SAT-M		X	.47	.37	459	69
3.	HSR			X	.66	61.7	9.2
4.	FTAG				X	2.14	.67

Whites

1.	SAT-V	X	.40	.30	.38	497	82
2.	SAT-M		X	.14	.35	500	76
3.	HSR			X	.45	60.3	6.0
4.	FTAG				X	2.38	.77

scoring black students on SAT, but tolerating (or sustaining) a wider range of performance on High School Rank, could only inflate the value of HSR and deflate SAT. The case from the data is probably overstated, but the point to be made is relatively straightforward: Assume a high relationship between HSR and FTAG, and the admission only of students with high HSR's, with consequent limitation of range on HSR in the admitted class. If, at the same time, because of a low relationship for SAT-V, this score is allowed to vary quite widely, then it may confidently be expected that the "best" predictor would become the "worst." If all applicants are identical on a predictor, yet vary in performance on the criterion, that "predictor" cannot be used to discriminate among the applicants in terms of probable success.

Although many of the institutions have conducted their own admissions studies, and although some of them compute a predicted grade (or optimum combination of the several preadmissions indices), a number in practice appear to use a procedure such as:

> "If SAT = 900 or above, admit regardless of HSR;
> If SAT = 800-900, admit if applicant stands in top half of high school class;
> If SAT = 700-800, admit if applicant stands in top quarter of class."

A class selected by such a means probably agrees reasonably well with one selected in terms of predicted grade, though some unusual effects may be introduced. If a minority group in a sending area typically achieves a composite score of 800 or less, and the same rule is applied to them; and, if the majority group typically achieves a score somewhat above 800 and, if the applicants from the two groups reflect two different kinds or qualities of secondary school experience - then, the rule of thumb procedures may create patterns that do not

guarantee acceptance or encouragement of the best risks among prospective applicants. It might also be noted that wide dissemination of such a set of criteria as that given in the example might attract those high school seniors with poor records but high SAT scores - a potential class of underachievers.

That is to say: the rule of thumb is given at college days to assembled high school seniors; they may remember it as: "All I have to have is an SAT above 900, and my grades won't count against me at X University!" Should this happen to any extent, the faculty may find they need unusual and atypical strategies to develop achievement habits commensurate with ability. It would be interesting to test how an obverse pronouncement might change the student body (that is: "If you stand in the top 5% of your class, admit regardless of score...etc.).

The probable impact of these and other factors that may serve to restrict the range of a preadmissions index, or affect its usual relationship to another predictor, may be best observed in the correlation matrices for the institutional subgroups. These are given in the appendix; the careful reader will want to study them and form his own conclusions. There do appear to be a number of institutions where selection factors may have "warped" the customary validities.

Before summarizing this section of the report, attention should be called to the findings at institution C, one of the traditionally black universities. A random sample of 100 freshmen females and 98 freshmen males was drawn.

Of this group, only about 60% had been ranked by their high school; the other 40% had only their high school transcript available.

Tables C1-1, C1-2 (samples with high school average) Tables C2-1, and C2-2 (samples with high school rank) (Tables in Appendix) suggest that Blacks whose schools did not provide a rank are more predictable by SAT scores and high school performance than is the case for black students whose high schools provided a rank in class. (In other studies, ranks work as well as averages).

This difference may be a result of chance variations in the small samples. Nevertheless, as most secondary schools with moderate populations of college aspirants do provide ranks, the differences may accrue from this factor, or from the possibility that ranked students in this case come more frequently from integrated schools, while unranked students come more frequently from essentially all black schools. It must be stressed that the differences may occur from random error. Nevertheless, the current study should be replicated with other classes at institution C, and, if the present findings still obtain, a more searching examination of their cause should be conducted.

It should also be noted that at (traditionally black) institution D, where all entering freshmen were used in this study, there were also, of 749 entering freshmen, 187 without ranks provided. At this institution, no phenomenon similar to that found at institution C is apparent; predictions seem moderately good for either group.

At this point, the interrelationships among the several predictors and the criterion, when viewed from the results that obtain from institution to institution and from subgroup to subgroup, yield the following findings, in addition to those already noted specifically with regard to differences in names and ranges on the measures studied, and differences in validities by a combination of race and sex rather than by race alone.

First, there seem to be marked differences among institutions. Many of the

findings by institution confirm previous published studies of students in earlier years (e.g., results for black females at institution K or for students at institution D, where validities are high, agree with previously published institutional studies, as do the lower validities for test scores at institution E agree with earlier studies). This is quite reasonable and logical: SAT-M may be more useful in an engineering program than in a liberal arts curriculum; SAT-V has generally in other studies worked better for females than for males; HSR could be expected to predict better where college work follows the same kind of pattern of demands as did high school, than where new or different approaches - e.g., independent study - are used.

The current findings, then, strongly suggest institutional and sex factors that affect the validity of the various predictors. It also appears that particular selection practices - or perceptions by students of what they need to enter a particular college and do well - affect the interrelationships among the predictors and criterion in critical ways.

The total burden of these data, beyond findings already noted, is:

1. The preadmissions evidence signaling success in college varies from institution to institution.
2. Consequently, each institution making explicit or implicit use of preadmission evidence of various kinds should conduct its separate inquiries, and set its own admissions policies accordingly, if these policies are to result in attracting or securing entering classes that are most likely to achieve success as defined by college grade point average.

Summary of Related Studies Elsewhere

A summary of relevant research through 1968 was drawn up at the beginning of the current study, and was presented to the Board of Higher Education at that time. It is reasonable to quote that statement again, to see how well the new experience confirms or refutes those findings. The statement read:

> The question of the meaning of scholastic aptitude test scores for Blacks or other cultural minorities is not new, and a number of relevant previous research studies are available, either as part of the published literature or as unpublished institutional studies.
>
> At this point, it is safe to say that the following conclusions, briefly documented here, tell a major story:
>
> 1. <u>On scholastic aptitude or achievement tests, Negroes at a point permitting the beginning of college training tend to score significantly lower than Whites</u>.

This fact is too well known to require documentation; a recent relevant statement, however, is that by Kendrick (1968), who has estimated that "not more than 15 percent and perhaps as few as 10 percent of Negro high school seniors would score 400 or more on the verbal section of the SAT (Scholastic Aptitude Test of CEEB). Only 1 or 2 percent would be likely to score 500 or more." It is indeed this fact that is the pressure, if not the justification, behind current black student demands for abolition of test barriers. For, if tests are indeed used to screen applicants, more Negroes than Whites will be screened out.

2. <u>Published studies of the ability of SAT to predict grades of black students in predominantly Negro colleges, however, show that SAT is as valid in this kind of situation as it is for Whites in predominantly white institutions</u>.

Typical of studies reporting this findings is one by McKelpin at North Carolina College, who reported (McKelpin, 1965) in his study of SAT and HS grades for predicting (black) students' performance at his institution (underlinings in original):

"<u>. . . the predictive validities based on the data for commonly used preadmission variables are as high as those usually reported for college freshmen . . . the SAT scores account for about 60 percent of the variation in the grades explainable by the data from the preadmission variables . . . when first semester grades are the criterion, SAT scores give a fair appraisal of the developed ability of students entering (predominantly Negro) colleges.</u>"

It is true, however (probably because of the gross differences between racial groups noted before), that the use of tests directed at lower educational levels than the entering college freshmen have seemed more useful with Negroes in some instances. For example, a recent unpublished paper by John Hills of Florida State University and Julian Stanley of Johns Hopkins (Hills and Stanley, 1968) is abstracted by the authors:

". . . the two subtests of Level 4 of the School and College Ability Tests (SCAT) for school grades 6-8, are shown to predict freshman-year grades in the three predominantly Negro coeducational colleges of a Southern state considerably better than did the Scholastic Aptitude Test (SAT), which was too difficult for approximately one-third of the enrolled freshmen. Relative improvement in multiple correlation for SCAT compared with SAT lessened when high-school grade average became one of the three joint predictors, apparently because high school grades of SAT-undifferentiated students supplied some of the missing intellective components."

3. Although very few studies have yet been done of the validity of SAT to predict grades for Blacks in integrated colleges, the available evidence supports the conclusion of no difference in predictive validity of SAT for Blacks vs. Whites in such institutions.

In a sophisticated study of the predictive value of SAT for Negro and white students in three integrated colleges, Cleary (1968) summarized her findings:

". . . in the two eastern colleges, no significant differences in the regression lines (SAT predicting grades, Blacks vs. Whites within a single institution) were found. In the one college in the southwest, significant differences were found, but it was the Negro scores which were over predicted. Thus, in one of the three schools, the Scholastic Aptitude Test was found to be slightly biased, but biased in favor of the Negro student."

The 'bias' in favor of the Negro student in the Cleary study was a result of finding, in effect, that at one of the three schools, Negro students with a given SAT score and high school rank made lower grades than white students with identical SAT scores and high school ranks. Thus, if a predicted level of performance is used in selecting among applicants, Negro applicants selected would achieve lower actual performance levels than their white counterparts, though they would more likely be admitted.

A similar finding has been obtained by Wilson (1969), who has studied performance and other characteristics of black vs. white students in four College Research Center institutions. He concludes, on this aspect of his data:

". . . An analysis of the relationship between Predicted Freshmen Grade (combining the Admissions variables -- SAT-V, SAT-M, Achievement Test average), and school rank), indicates that traditional admissions criteria tend to be at least as correlationally valid for black students

as for entering students generally. There is moreover some evidence that predictions made on the basis of standard formulae may tend to over-estimate the first-year performance of Black students in the several colleges studied."

Again this indicates, as in the Cleary study, that the use of SAT may lead to accepting Negroes who are poorer academic risks than lower-scoring Whites who may be excluded if similar standards are employed. This is not to state that such admissions should not take place; rather these findings are cited to show an absence of evidence for the black student claim that tests are biased against Negroes.

4. If one attempts to make a case for bias in SAT because certain subgroups of the population make lower scores than others, the evidence points to deficit as a result of cultural disadvantage rather than as a result of racial origin.

Cleary and Hilton (1968) studied performance of PSAT, item by item, for grade 12 students in integrated high schools. When Blacks were compared with Whites of similar socioecomonic levels, they concluded:

". . . From the bivariate plots of sums of item scores, it was apparent that there were few items producing an uncommon discrepancy between the performance of Negro and White students. It must therefore be concluded that, given the stated definition of bias, the PSAT for practical purposes is not biased for the groups studied."

5. Experience with special remedial programs for high-risk students, (e.g., students whose test scores indicate high probability of academic failure), or attempts to improve test scores (and grade performance) by special coaching, seem to indicate that at the very least unusual efforts will be needed to improve academic performance.

For example, after reviewing a large body of the literature on remedial education in the community junior college, Roueche (1968) concludes:

". . . The large majority of students who enroll in remedial courses fail to complete those courses satisfactorily and are doomed to failure or are forced to terminate their education. In one typical California public junior college, of the 80 percent of the entering students who enrolled in remedial English, only 20 percent of that number continued on into regular college English classes."

In a study of the effect of well-contrived and intensive instruction (though of short term duration from 4 to 6 weeks) in the kinds of cognitive tasks involved in scholastic tests, Roberts (of Fisk University), and Oppenheim (of Educational Testing Service) found

(Roberts and Oppenheim, 1966) with students with inadequate instruction in the past, that "it does not seem reasonable to expect that similar short term instruction given on a wide scale would be of significant benefit to disadvantaged students."

6. From institution to institution, and from year to year, the specific validities of preadmission indices will vary.

This is the matter of widespread experience; it probably results from a combination of factors: differences in curricula, heterogeneity of students, difference in institutional evaluational styles, etc. (This matter assumes added importance in the present context, however, for it is reasonable to assume that if an ability (measured traditionally) free system of instruction were developed, ability tests would not be relevant to predicting success in that system.)

What may be concluded from these findings? More precisely, they indicate that there is the strong likelihood that if tests are being used properly in selective admissions in North Carolina colleges, there is no prejudicial impact against Negro applicants, assuming that the criterion of satisfactory performance in college, traditionally measured, is valid for use in selection. Nevertheless, the specific validities among the institutions will vary, and should be continuously examined, if test scores are used as a basis for excluding applicants.

This, then, was the statement of experience elsewhere, prepared for the Board of Higher Education prior to the present study.

In a review of the literature released after the beginning of the N. C. study, Flaugher (1970) notes several common criticisms of the use of tests with minority group members (e.g., irrelevancy of content to the minority culture and background, or the failure of tests to measure attributes that for the minority group member are related to performance), and notes a number of studies that find lower scores on scholastic aptitude tests for Negroes, Mexican Americans, Puerto Ricans, and American Indians. He states however:

> Lower test scores for a particular minority group are not in themselves evidence of unfair testing practices. Assuming a fair, unbiased criterion, ultimate conclusions about the question of test bias must rest on evidence concerning the validity of the particular tests in predicting the criterion. Regardless of the score distributions of any subgroups, if the success of the members of these subgroups is predicted equally well using the prediction procedures appropriate for the entire group, then the practice is not discriminatory.

Flaugher notes among his concluding suggestions for research the fact that tests may, in effect, work well for Blacks because tests reflect the same "cultural biases" that the college curriculum and academic demands contain. He states:

> A complexity concerns the relaxation of the usual admissions standards in order to increase the enrollment of minorites. Given an unchanged curriculum, and no change in the aptitudes demanded by it, there is every reason to expect that these students will be unable to perform well, unless extraordinary efforts are made to motivate students to a degree exceeding that of most of the other students with whom they are competing. On the other hand, if the curriculum demands can be altered to fit the particular abilities existing in these special populations, then the resulting successful performance will once again alter the validity of the selection tests.

In a paper presented at the College Board's Colloquium on Barriers to Higher Education, (Stanley, 1970) and later published in a revised form in Science (Stanley, 1971), Stanley provides an excellent bibliography that includes some of the major instances where claims are made that traditional admissions tests are not appropriate for minority racial, ethnic, or socioeconomic groups. He suggests, however, that this conclusion comes from an absence of data and faulty logic in some instances, and/or inadequate design of studies in others. He states "For black students, especially, the differential-validity hypothesis has been found untenable, except that sometimes test scores overpredict the academic achievement of the disadvantaged." His summary reads in the original paper in part:

> Test scores predict the college grades of blacks at least as well as they do those of whites. High-school grades considerably augment the prediction for both groups. Students, regardless of socioeconomic level, who are predicted to earn quite low grades within a particular college will tend to have academic difficulties if enrolled in it. There is social and educational justification for admitting to a particular college some minority-group students who are marginally qualified for it academically, provided that they are given adequate financial aid and effective remedial courses, tutoring, and coaching. If entrants are greatly underqualified academically for a particular college, however, new curricula will be required.

A major study of black vs. white students in traditionally white institutions becoming available during the course of the present investigation is one by Temp (1970). This study, running concurrently with the present North Carolina inquiry, examined the validities for SAT scores for Blacks vs. Whites at thirteen traditionally white colleges and universities where there were substantial numbers of Blacks. Temp found that different regressions are technically required at many institutions but also stated additional evidence of the bias, or overprediction of grades, for Blacks when the majority regression equation is used (in all but one of the 13 instances; in that case, the number of black students was only 39).

Temp summarizes his findings:

(1) A single regression plane cannot be used to predict GPA for both Blacks and Whites in many of the institutions studied.

(2) If predictions of GPA from SAT scores are based upon regression equations suitable for majority students, then minority black students, as a group, are predicted to do about as well (or better) than they actually do.

There are a host of other published studies or reviews beyond those already cited. These include: Roberts (1962, 1964); Hills, Klock, and Lewis (1963); Munday (1965); Boney, (1966); Olsen (1967); Funches (1967); Stanley and Porter (1967); Perlberg (1967); Peterson (1968); Bowers (1970); and Kendrick and Thomas (1970). These have involved SAT, tests of the American College Testing Program, and other similar college level tests - both separately and in combination with high school grades. In none of these studies is there clear evidence of reduced predictive validity for black students under that typically found for white students. It would seem reasonable to state that test scores predict as well for Blacks as for Whites and that in a large number of

instances tests provide better estimates of performance in college than do high school grades -- a finding that may reflect the kinds of secondary schools that as recently as several years ago most Blacks attended.

There are not only these and previously cited studies of the prediction of grades in college, but also studies of test prediction of job performance criteria. These include Campion and Freihoff (1970); Tenopyr (1967); Grant and Bray (1970); Campbell, Pike, and Flaugher (1969); and Flaugher, Campbell, and Pike (1969), where tests are found to overpredict, not underpredict grades or performance when applied to non-Whites. Tenopyr (1967, p. 15) calls it "unfair discrimination (which) however, would favor, not penalize, the Negroes." Campion and Freihoff (1970, p. 13) state: "...test validation studies which ignore (racial) subgroup analysis could easily result in unfair employment practices." In addition to the previously noted technical argument by Linn and Werts (1970) is the explanation afforded by Rock (1970) that motivation toward achievement in college is typically a white middle-class phenomenon, and that non-Whites may not be as likely "to utilize to the maximum what aptitudes they possess." Effectiveness in work performance may also involve middle-class values.

A final study deserving special mention because of the size of the samples of Blacks compared with Whites in a traditionally white university, and because of the sophistication of treatment, is one by Bowers (1970) at the University of Illinois. For 168 men and 237 women in a "Special Educational Opportunity Program," vs. 2938 men and 1917 women in the regular program (all entering in 1968), separate regression equations again were found to be justified.

Thus, the findings in North Carolina do not appear discrepant from the accumulating published evidence.

Limitations

There are a number of important, even critical limitations in the present inquiry, even though the evidence found is not incongruent with findings elsewhere.

A first limitation is the relative triviality of the basic question - that is, the validity of conventional preadmissions indices for black versus white students in college - when considered against the more pressing issues of finding ways to provide the most suitable higher education for cultural minorities, or of closing gaps that many decades of different cultures and environments may have produced. Other studies of the Board of Higher Education and its cohorts are properly to be directed to these questions.

A second limitation is the small size of the samples. Except where the institutional group involved all students in a class, the regression equations are probably not proper to be used in formal ranking of candidates in terms of promise. Although the correlations cited may be viewed as a base or trend of some sort, it would seem imperative to press for larger numbers of black students in white colleges on which to base more definitive studies - either by accumulating data over time, or by effective recruiting and admission of larger groups of black students.

Related to the limitation of small sample size are pecularities in regressions. For example, a "scatter plot" of black females at institution K shows three girls with SAT-V scores in the 550-600 range (who all made grades above 2.0), but with the bulk of the other black females scoring from 375 to 500, and ranging in first term grade performance from 0.8 to 2.8. Although the high validity found corresponds to that found at institution K in previous studies (see Harris, 1967), the relationship found would be reduced from .59 to .50 with the exclusion of the three high-scoring cases.

Another serious limitation of the present study has to do with the fact that the criterion herein was limited to the first term grade average (for the purpose of accumulating the largest numbers possible of the critical black student in white college group). One danger is pointed up by an unpublished study by John Davis at East Carolina University, where (1) initial low grade performance of black students, as shown in the first term average, tends to disappear as experience accumulates, and (2) different validities obtain between pre-admission indices and the sophomore average grade as opposed to the first term average. Further, that study found that the relationship between first term and sophomore year average was quite high for white students, as has generally been found, but was substantially and significantly lower for black students. This suggests that the first term average may not predict later performance as well for Blacks as for Whites, that Blacks need a period of time for making adjustments to the university demands, for catching up or for coming to feel at home. Also a problem in the present use of first term average is the fact that in some instances the course loads of black students involved varying quantities of special or remedial courses.

Finally, it must be noted that the phenemenon of black student in white institution in the South is relatively new, and that basic changes in society and its educational practices that may introduce new forces and capacities are continuing. The next generation of black students, for example, may come from markedly different secondary school environments than the previous all-black situation. Social and emotional pressures related to the current black movement, the current strong pressures to recruit Blacks and use financial aid where before black students had to push their way in vigorously, can affect the regressions of grades on ability. In short, such studies as the present one need to be conducted within and across institutions, and must be repeated to note trends that may develop over time.

Summary and Recommendations

This study examined the levels of performance on tests of black versus white students in fifteen public universities of North Carolina, and the validities of test scores and high school grades for predicting performance in college. It must be viewed as limited rather severely by the use at this initial point of only the first-term grade average as the criterion of academic performance, and, for black students in white colleges, by the relatively small numbers of black students. Nevertheless, the principal findings, while not necessarily conclusive, are in agreement with the major burden of similar studies elsewhere, and may be stated as follows:

1. Black students attending traditionally black universities in North Carolina have lower test scores than do black students attending traditionally white institutions.
2. Black students at white institutions in North Carolina have lower test scores than their white counterparts at that insitution, but, in some instances, higher scores than white students at some other white institutions in North Carolina.
3. Black students at traditionally white institutions in North Carolina tend to have higher standings in their high school class of graduation than do their white counterparts at that institution. If action by admissions officers - or from self-selection forces - are resulting in higher standards for admission of Blacks to white institutions, these higher standards appear to be on the basis of high school grades, not test scores.
4. The small numbers of black students found at this point in traditionally white institutions in North Carolina, as well as the use of the first term grade average as criterion, permit the only prudent answer to the question of validity of tests for Blacks in white institutions to be that

there is yet insufficient evidence for any conclusive interpretation; each institution, or the Board of Higher Education, should continue this inquiry as larger numbers of black students appear in traditionally white institutions. Nevertheless, taking the entire range of validity coefficients for the subgroups by sex and race, the median validities of the best combination of the three predictors (e.g., the multiple correlation coefficients) are .365, .525, and .47 for black males, black females, and black males and females combined in the black institutions; the corresponding medians for white students in white institutions are .45, .585, and .54. These black-white differences do not seem substantial.

5. There is some evidence in the current study confirming that in other studies elsewhere, the most appropriate and accurate prediction of performance in college is achieved by considering white males, white females, black males, and black females separately (provided there are sufficient numbers in these subgroups for regression analyses); and, that females are most predictable, and (perhaps), then white males, then black males. In other words, the SAT and High School Performance appear most valid for females, and least valid among sex and race subgroups for black males.

6. If the white majority prediction formulas were applied to black applicants, there is no evidence that this practice would discriminate against Blacks; rather, it appears here as in other studies that such a practice might result in selecting Blacks of less promise of satisfactory grade achievement than Whites of similar standing. This suggests that black students may bring with them to college other handicaps than whatever tests may measure - poorer preparation, less efficient study skills, lower levels of motivation to achieve academically, or more anxiety-invoking proclivities in the white college setting.

7. There appear to be marked differences among the separate institutions in the specific patterns of validities for tests and high school performance. This means that <u>if selection or attraction of students most likely to achieve good grades is a reasonable policy and goal</u>, then each institution should conduct its own validity studies, considering sex and race separately, and set its selection - or selective recruiting - policy accordingly.

Accordingly, and with particular attention to the limitations of this study in the scope of the question asked and in the small sample sizes of black students in white colleges, it is recommended:

1. The individual institutions (and/or, perhaps, the sponsors of this study) should view the current findings as tentative, and in particular should press to extend the studies toward accumulating larger numbers of black students in white institutions for statistical analyses, and to add more substantial criteria of performance in college (such as fact of graduation or freshman, sophomore, junior, and senior grade averages). This is particularly critical if tests and high school performance are used to select students.

2. It must also be noted that in a larger perspective, the questions raised in the current study take on a maudlin quality. The real issues, and the urgent needs for research and pr ammatic attention, lie in the removal of other barriers to equal access to higher education opportunity that can yield to better informational resources, better guidance, new financial aid resources more fairly distributed, etc.; or in institutional or instructional facilitations that may permit the culturally different student a real chance for honest and societally useful growth and development.

APPENDIX

TABLE A1

Correlations, Means, Standard Deviations
for Black Males, Institution A (N=96)

	SATM	HSR	FTGA	Mean	S.D.
SATV	.25	.03	.14	338	58.4
SATM		-.04	.12	363	56.7
HSR			.19	54.5	6.6
FTGA				1.92	0.58

TABLE A2

Correlations, Means, Standard Deviations
for Black Females, Institution A (N=37)

	SATM	HSR	FTGA	Mean	S.D.
SATV	.17	.24	.32	337	51.2
SATM		.46	.44	356	51.9
HSR			.58	58.6	8.0
FTGA				2.08	.57

TABLE A3

Correlations, Means, Standard Deviations
for All Blacks, Institution A (N=193)

	SATM	HSR	FTGA	Mean	S.D.
SATV	.21	.13	.22	337	54.7
SATM		.20	.26	360	53.8
HSR			.42	56.6	7.9
FTGA				2.00	0.58

TABLE B1

Correlations, Means, Standard Deviations
for Black Males, Institution B (N=100)

	SATM	HSR	FTGA	Mean	S.D.
SATV	.27	.18	.14	338	62
SATM		.28	.15	385	66
HSR			.34	55.6	7.9
FTGA				2.07	0.56

TABLE B2

Correlations, Means, Standard Deviations
for Black Females, Institution B (N=100)

	SATM	HSR	FTGA	Mean	S.D.
SATV	.55	.20	.24	334	58
SATM		.27	.29	369	52
HSR			.49	60.1	7.4
FTGA				2.28	0.56

TAPLE B3

Correlations, Means, Standard Deviations
for All Blacks, Institution B (N=200)

	SATM	HSR	FTGA	Mean	S.D.
SATV	.39	.17	.18	336	60
SATM		.22	.18	377	60
HSR			.44	57.9	8.0
FTGA				2.18	0.57

TABLE C1-1

Correlations, Means, Standard Deviations
for Black Males, Institution C, Group without HSR (N=45)

	SATM	HSAV	FTGA	Mean	S.D.
SATV	.18	.30	.48	377	63
SATM		.02	.04	396	56
HSAV			.36	9.1	2.0
FTGA				2.01	0.59

TABLE C1-2

Correlations, Means, Standard Deviations
for Black Females, Institution C, Group without HSR (N=35)

	SATM	HSAV	FTGA	Mean	S.D.
SATV	.22	-.02	.34	380	56
SATM		.02	.07	403	51
HSAV			.53	10.4	1.9
FTGA				2.22	0.78

TABLE C1-3

Correlations, Means, Standard Deviations
for All Blacks without HSR, Institution C (N=80)

	SATM	HSAV	FTGA	Mean	S.D.
SATV	.19	.18	.41	378	60
SATM		.04	.06	399	54
HSAV			.46	9.7	2.1
FTGA				2.10	0.69

TABLE C2-1

Correlations Means, Standard Deviations
for Black Males, Institution C, Group with HSR (N=53)

	SATM	HSR	FTGA	Mean	S.D.
SATV	.38	.06	.01	377	61
SATM		.29	.04	422	67
HSR			.16	56.3	7.9
FTGA				1.87	0.65

TABLE C2-2

Correlations, Means, Standard Deviations
for Black Females, Institution C, Group with HSR (N=65)

	SATM	HSR	FTGA	Mean	S.D.
SATV	.11	.04	.14	375	54
SATM		.27	.33	385	45
HSR			.31	59.4	7.6
FTGA				2.26	0.66

TABLE C2-3

Correlations, Means, Standard Deviations
for All Blacks, Institution C, Group with HSR (N=118)

	SATM	HSR	FTGA	Mean	S.D.
SATV	.26	.05	.07	376	57
SATM		.20	.06	401	59
HSR			.29	58.0	7.9
FTGA				2.08	0.68

TABLE D1-1

Correlations, Means, Standard Deviations
for Black Males, Institution D, Group with HSR (N=210)

	SATM	HSRA	FTGA	Mean	S.D.
SATV	.29	.06	.15	345	52
SATM		.16	.15	381	61
HSRA			.35	52.9	8.5
FTGA				1.90	0.78

TABLE D1-2

Correlations, Means, Standard Deviations
for Black Females, Institution D, Group with HSR (N=342)

	SATM	HSRA	FTGA	Mean	S.D.
SATV	.32	.20	.36	350	58
SATM		.21	.33	370	59
HSRA			.42	57.7	8.1
FTGA				2.20	0.74

TABLE D1-3

Correlations, Means, Standard Deviations
for All Blacks, Institution D, Group with HSR (N=552)

	SATM	HSRA	FTGA	Mean	S.D.
SATV	.31	.16	.28	348	56
SATM		.16	.24	374	60
HSRA			.42	55.8	8.6
FTGA				2.08	0.77

TABLE D2-1

Correlations, Means, Standard Deviations
for Black Males without HSR, Institution D (N=70)

	SATM	ESRA	FTGA	Mean	S.D.
SATV	.52	-.03	.25	362	67
SATM		-.08	.24	411	75
ESRA			.32	53.6	5.2
FTGA				2.00	0.72

TABLE D2-2

Correlations, Means, Standard Deviations
for Black Females without HSR, Institution D (N=117)

	SATM	ESRA	FTGA	Mean	S.D.
SATV	.42	.06	.34	356	56
SATM		.22	.36	373	59
ESRA			.32	57.1	6.0
FTGA				2.23	0.72

TABLE D2-3

Correlations, Means, Standard Deviations
for All Blacks without HSR, Institution D (N=187)

	SATM	ESRA	FTGA	Mean	S.D.
SATV	.47	.01	.29	358	61
SATM		.01	.25	387	68
ESRA			.35	55.8	5.9
FTGA				2.14	0.73

TABLE E1

Correlations, Means, Standard Deviations
for Black Males, Institution E (N=118)

	SATM	HSR	FTGA	Mean	S.D.
SATV	.19	.01	.15	364	59
SATM		.06	.07	386	51
HSR			.28	52.3	8.4
FTGA				1.93	0.75

TABLE E2

Correlations, Means, Standard Deviations
for Black Females, Institution E (N=183)

	SATM	HSR	FTGA	Mean	S.D.
SATV	.22	.18	.20	363	52
SATM		.15	.29	378	55
HSR			.37	58.7	7.3
FTGA				2.16	0.70

TABLE E3

Correlations, Means, Standard Deviations
for All Blacks, Institution E (N=201)

	SATM	HSR	FTGA	Mean	S.D.
SATV	.21	.09	.17	363	55
SATM		.07	.19	381	53
HSR			.36	56.2	8.4
FTGA				2.07	0.72

TABLE F1

Correlations, Means, Standard Deviations
for White Males, Institution F (N=100)

	SATM	HSR	FTGA	Mean	S.D.
SATV	.44	.18	.20	504	59
SATM		.18	.24	570	68
HSR			.36	60.0	6.7
FTGA				2.32	0.63

TABLE F2

Correlations, Means, Standard Deviations
for White Females, Institution F (N=101)

	SATM	HSR	FTGA	Mean	S.D.
SATV	.30	.02	.15	525	60
SATM		.19	.19	569	65
HSR			.36	66.2	5.7
FTGA				2.46	0.61

TABLE F3

Correlations, Means, Standard Deviations
for All Whites, Institution F (N=201)

	SATM	HSR	FTGA	Mean	S.D.
SATV	.36	.17	.19	515	61
SATM		.16	.21	570	66
HSR			.37	63.1	6.9
FTGA				2.39	0.62

TABLE F4

Correlations, Means, Standard Deviations
for Black Males, Institution F (N=73)

	SATM	HSR	FTGA	Mean	S.D.
SATV	.35	-.10	-.05	453	63
SATM		.02	.23	496	69
HSR			.11	63.2	6.7
FTGA				1.70	0.79

TABLE F5

(omitted; limited data)

TABLE F6

Correlations, Means, Standard Deviations
for All Blacks, Institution F (N=97)

	SATM	HSR	FTGA	Mean	S.D.
SATV	.44	.16	.13	468	71
SATM		.17	.26	506	69
HSR			.22	65.0	7.2
FTGA				1.76	0.77

TABLE G1

Correlations, Means, Standard Deviations
for White Males, Institution G (N=100)

	SATM	HSR	FTGA	Mean	S.D.
SATV	.21	-.11	.26	470	63
SATM		-.02	.15	524	63
HSR			.34	56.0	4.7
FTGA				2.17	0.66

TABLE G2

Correlations, Means, Standard Deviations
for White Females, Institution G (N=100)

	SATM	HSR	FTGA	Mean	S.D.
SATV	.40	.30	.38	497	82
SATM		.14	.35	500	76
HSR			.45	60.3	6.0
FTGA				2.38	0.77

TABLE G3

Correlations, Means, Standard Deviations
for All Whites, Institution G (N=200)

	SATM	HSR	FTGA	Mean	S.D.
SATV	.28	.20	.35	484	74
SATM		.01	.24	512	71
HSR			.43	58.1	5.8
FTGA				2.27	0.72

TABLE G4

Correlations, Means, Standard Deviations
for Black Males, Institution G (N=36)

	SATM	HSR	FTGA	Mean	S.D.
SATV	-.44	-.00	-.06	401	55
SATM		.06	.27	462	54
HSR			.24	58.6	8.0
FTGA				1.72	0.73

TABLE G5

Correlations, Means, Standard Deviations
for Black Females, Institution G (N=31)

	SATM	HSR	FTGA	Mean	S.D.
SATV	.25	-.12	.02	434	67
SATM		.47	.37	460	69
HSR			.66	61.7	9.2
FTGA				2.15	0.67

TABLE G6

Correlations, Means, Standard Deviations
for All Blacks, Institution G (N= 67)

	SATM	HSR	FTGA	Mean	S.D.
SATV	-.05	-.01	.06	416	62
SATM		.28	.30	461	61
HSR			.46	60.0	8.6
FTGA				1.92	0.73

TABLE H1

Correlations, Means, Standard Deviations
for White Males, Institution H (N=92)

	SATM	HSR	FTGA	Mean	S.D.
SATV	.14	.18	.17	434	61
SATM		.29	.20	487	68
HSR			.54	54.7	6.5
FTGA				1.97	0.75

TABLE H2

Correlations, Means, Standard Deviations
for White Females, Institution H (N=83)

	SATM	HSR	FTGA	Mean	S.D.
SATV	.25	.33	.24	461	72
SATM		.37	.18	470	77
HSR			.47	60.0	6.8
FTGA				2.37	0.75

TABLE H3

Correlations, Means, Standard Deviations
for All Whites, Institution H (N=175)

	SATM	HSR	FTGA	Mean	S.D.
SATV	.17	.31	.24	447	68
SATM		.27	.15	480	73
HSR			.55	57.2	7.2
FTGA				2.16	0.78

TABLES H4,5
(omitted; limited data)

TABLE H6

Correlations, Means, Standard Deviations,
for All Blacks, Institution H (N=32)

	SATM	HSR	FTGA	Mean	S.D.
SATV	.43	-.04	.26	376	70
SATM		-.21	.15	395	74
HSR			.22	56.3	7.1
FTGA				1.52	0.84

TABLE I1

Correlations, Means, Standard Deviations
for White Males, Institution I (N=97)

	SATM	HSR	FYGA	Mean	S.D.
SATV	.50	.21	.29	451	79
SATM		.25	.29	523	86
HSR			.37	56.8	6.5
FYGA				1.87	0.68

TABLE I2

Correlations, Means, Standard Deviations
for White Females, Institution I (N=96)

	SATM	HSR	FYGA	Mean	S.D
SATV	.39	.35	.33	459	69
SATM		.50	.36	490	76
HSR			.61	60.2	5.7
FYGA				2.13	0.71

TABLE I3

Correlations, Means, Standard Deviations
for All Whites, Institution I (N=193)

	SATM	HSR	FYGA	Mean	S.D.
SATV	.43	.28	.31	455	74
SATM		.28	.28	506	83
HSR			.51	58.5	6.3
FYGA				2.00	0.70

TABLES I4,5

(omitted; limited data)

TABLE I6

Correlations, Means, Standard Deviations
for All Blacks, Institution I (N=41)

	SATM	HSR	FYGA	Means	S.D.
SATV	.22	.24	.19	383	61
SATM		.08	.09	414	72
HSR			.45	61.1	5.8
FYGA				1.89	0.69

TABLE J1

Correlations, Means, Standard Deviations
for White Males, Institution J (N=100)

	SATM	HSR	FTGA	Mean	S.D.
SATV	.43	.24	.43	518	82
SATM		.23	.52	582	77
HSR			.45	61.3	7.4
FTGA				2.18	0.80

TABLE J2

Correlations, Means, Standard Deviations
for White Females, Institution J (N=100)

	SATM	HSR	FTGA	Mean	S.D.
SATV	.38	.07	.32	525	77
SATM		.20	.29	543	75
HSR			.34	62.6	5.9
FTGA				2.36	0.67

TABLE J3

Correlations, Means, Standard Deviations
for All Whites, Institution J (N=200)

	SATM	HSR	FTGA	Mean	S.D.
SATV	.38	.17	.39	522	80
SATM		.19	.37	562	78
HSR			.42	61.9	6.7
FTGA				2.27	0.74

TABLES J4,5

(omitted; limited data)

TABLE J6

Correlations, Means, Standard Deviations
for All Blacks, Institution J (N=43)

	SATM	HSR	FTGA	Mean	S.D.
SATV	.44	.06	.43	417	65
SATM		-.09	.39	469	89
HSR			.06	63.7	5.9
FTGA				1.77	0.67

TABLE K1

Correlations, Means, Standard Deviations
for White Males, Institution K (N=85)

	SATM	HSR	FTGA	Mean	S.D.
SATV	.19	-.07	.17	516	80
SATM		.11	.09	553	74
HSR			.08	55.8	10.9
FTGA				1.91	0.75

TABLE K2

Correlations, Means, Standard Deviations
for White Females, Institution K (N=102)

	SATM	HSR	FTGA	Mean	S.D.
SATV	.51	.27	.38	530	80
SATM		.34	.42	534	70
HSR			.54	64.0	6.3
FTGA				2.31	0.64

TABLE K3

Correlations, Means, Standard Deviations
for All Whites, Institution K (N=187)

	SATM	HSR	FTGA	Mean	S.D.
SATV	.34	.10	.29	524	80
SATM		.12	.20	543	72
HSR			.33	60.3	9.6
FTGA				2.13	0.71

TABLE K4

(ommitted; limited data)

TABLE K5

Correlations, Means, Standard Deviations
for Black Females, Institution K (N=33)

	SATM	HSR	FTGA	Mean	S.D.
SATV	.25	.16	.59	448	54
SATM		.31	.37	466	53
HSR			.37	66.1	4.8
FTGA				1.73	.66

TABLE K6

Correlations, Means, Standard Deviations
for All Blacks, Institution K (N=38)

	SATM	HSR	FTGA	Mean	S.D.
SATV	.20	.11	.59	446	55
SATM		.36	.40	462	51
HSR			.40	65.5	5.0
FTGA				1.66	0.67

TABLE L1

Correlations, Means, Standard Deviations
for White Males, Institution L (N=100)

	SATM	HSR	FTGA	Mean	S.D.
SATV	.29	.27	.31	429	68
SATM		.26	.28	459	68
HSR			.21	51.8	6.5
FTGA				1.62	0.91

TABLE L2

Correlations, Means, Standard Deviations
for White Females, Institution L (N=100)

	SATM	HSR	FTGA	Mean	S.D.
SATV	.45	.22	.38	445	81
SATM		.51	.46	447	70
HSR			.66	57.9	6.5
FTGA				2.14	0.83

TABLE L3

Correlations, Means, Standard Deviations
for All Whites, Institution L (N=200)

	SATM	HSR	FTGA	Mean	S.D.
SATV	.36	.27	.36	437	75
SATM		.31	.32	453	69
HSR			.49	54.8	7.2
FTGA				1.88	0.91

TABLE M1

Correlations, Means, Standard Deviations
for White Males, Institution M (N=86)

	SATM	HSR	FTGA	Mean	S.D.
SATV	.39	.10	.40	486	84
SATM		.23	.15	530	71
HSR			.35	55.8	6.4
FTGA				1.13	0.54

TABLE M2

Correlations, Means, Standard Deviations
for White Females, Institution M (N=66)

	SATM	HSR	FTGA	Mean	S.D.
SATV	.30	.01	.33	494	87
SATM		.40	.26	490	85
HSR			.34	60.1	7.5
FTGA				1.42	0.60

TABLE M3

Correlations, Means, Standard Deviations
for All Whites, Institution M (N=152)

	SATM	HSR	FTGA	Mean	S.D.
SATV	.32	.07	.37	490	85
SATM		.22	.13	513	79
HSR			.39	57.7	7.2
FTGA				1.26	0.58

TABLE N1

Correlations, Means, Standard Deviations
for White Males, Institution N (N=96)

	SATM	HSR	FTGA	Mean	S.D.
SATV	.33	.04	.26	426	63
SATM		.18	.27	472	83
HSR			.52	52.4	6.0
FTGA				1.72	0.75

TABLE N2

Correlations, Means, Standard Deviations
for White Females, Institution N (N=99)

	SATM	HSR	FTGA	Mean	S.D.
SATV	.49	.33	.42	450	73
SATM		.27	.40	455	73
HSR			.61	59.7	6.8
FTGA				2.13	0.71

TABLE N3

Correlations, Means, Standard Deviations
for All Whites, Institution N (N=195)

	SATM	HSR	FTGA	Mean	S.D.
SATV	.38	.26	.37	438	69
SATM		.14	.28	463	78
HSR			.61	56.1	7.4
FTGA				1.93	0.76

TABLE 01

Correlations, Means, Standard Deviations
for White Males, Institution 0 (N=222)

	SATM	HSR	FTGA	Mean	S.D.
SATV	.03	.12	.27	404	63
SATM		.17	.28	449	64
HSR			.26	48.6	9.3
FTGA				1.65	0.66

TABLE 02

Correlations, Means, Standard Deviations
for White Females, Institution 0 (N=70)

	SATM	HSR	FTGA	Mean	S.D.
SATV	.38	.24	.51	433	67
SATM		.45	.34	430	61
HSR			.50	57.9	10.9
FTGA				2.32	0.79

TABLE 03

Correlations, Means, Standard Deviations
for All Whites, Institution 0 (N=292)

	SATM	HSR	FTGA	Mean	S.D.
SATV	.09	.21	.38	411	65
SATM		.17	.22	445	64
HSR			.43	50.9	10.5
FTGA				1.81	0.75

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